WHAT IS CLAIMED IS:

1. A method for isolating a protein molecule or population of protein or peptide molecules, comprising:

(a) contacting one or more cellular sources of protein or peptide molecules with at least one pore-containing matrix which substantially retards the flow of high molecular weight molecules, structures, and aggregates but does not substantially retard the flow of soluble protein and peptide molecules;

(b) separating or substantially separating said molecules from said high molecular weight molecules and structures.

2. The method of claim 1, further comprising causing the cellular source to release all or a portion of the said protein or peptide molecules.

3. The method of claim 1, wherein said matrix is selected from the group consisting of a polyester matrix, a polyolefin matrix, a sintered polyethylene matrix, a nitrocellulose matrix, a cellulose acetate matrix, a nylon matrix, a cellulose matrix and a silica matrix.

4. The method of claim 1, wherein the average size of said pores in said matrix range from about 1,000 microns to about 0.1 microns in diameter.

5. The method of claim 4, wherein said pores are from about 500 to about 1 microns in diameter.

6. The method of claim 5, wherein said pores are from about 400 to about 25 microns in diameter.

7. The method of claim 1, wherein said release of the said protein or peptide molecules are accomplished by a lysis/disruption/permeabilization composition or compound.

8. The method of claim 7, wherein said lysis/disruption/permeabilization composition comprises one or more detergents.

9. The method of claim 7, wherein said lysis/disruption/permeabilization composition comprises one or more enzymes.

10. The method of claim 9, wherein said enzyme is lysozyme, lysostaphin or zymolyase.

11. The method of claim 1, wherein said matrix comprises one or more lysis/disruption/permeabilization compositions or compounds.

12. The method of claim 1, further comprising

(a) contacting said filter with a composition that disrupts and/or solubilizes protein aggregates and/or membrane fragments;

(b) collecting the solubilized or disrupted protein or peptide molecules.

13. The method of claim 12, wherein said composition comprises a detergent, chaeotropic agent or salt.

14. The method of claim 13, wherein said chaeotropic agent is urea.

15. The method of claim 1, further comprising collecting said protein or peptide molecules.

16. The method of claim 1, wherein said cellular source is a cell selected from the group consisting of a bacterial cell, a yeast cell, a fungal cell, an animal cell, a cell infected by a virus and a plant cell.

17. The method of claim 16, wherein said bacterial cell is an *Escherichia coli* cell.

18. The method of claim 16, wherein said yeast cell is a *Sacchromyces* cell.

19. An isolated protein or peptide molecule produced by the method of claim 1.

20. A composition for use in isolating a protein or peptide molecule or a population of protein or peptide molecules, said composition comprising:

(a) one or more cellular sources of said protein or peptide molecules;

(b) one or more pore-containing matrices which substantially retard the flow of high molecular weight molecules, structures, and aggregates but do not substantially retard the flow of soluble protein and peptide molecules; and optionally

(c) at least one compound or composition that lyses/disrupts/permeabilizes said cellular source.

21. An apparatus for extracting and isolating protein or peptide molecules, comprising:

(a) a housing; and

(b) one or more pore-containing matrices, which substantially retard the flow of high molecular weight molecules, structures, and aggregates but do not substantially retard the flow of said protein and peptide molecules in said container; and

(c) at least one composition selected from the group consisting of chromatographic resins that bind proteins or peptides, chromatographic resins that bind impurities, chromatographic resins having bound thereto protein modifying reagents, chromatographic resins having bound thereto enzymes, chromatographic resins having bound thereto nucleic acids, chromatographic resins having bound thereto an enzyme substrate, filters, and compositions capable of being used for detecting or quantifying the amount of protein or nucleic acid present in the sample.

22. The apparatus of claim 21, further comprising a porous solid support.

23. The apparatus of claim 21, wherein said pore containing matrix divides said tube into a sample application section and a sample collection section.

24. The apparatus of claim 21, wherein said pore containing matrix is selected from the group consisting of: a frit, a plug, a cartridge, or a swab tip.

25. The apparatus of claim 21, wherein said pore containing matrix is selected from the group consisting of: polyester, polyolefin, scintered polyethylene, nitrocellulose, cellulose acetate, nylon, cellulose, porous ceramic, silica, polysaccharide, and polymer.

26. The apparatus of claim 21, wherein said pore containing matrix is a solid matrix.

27. The apparatus of claim 21, wherein said pore containing matrix is a semi solid matrix.

28. The apparatus of claim 21, wherein the average size of said pores in said matrix range from about 0.1 to about 10,000 microns in diameter.

29. The apparatus of claim 23, wherein said sample collection section has an access port formed therein.

30. The apparatus of claim 21, wherein said pore containing matrix comprises a cell lysis/disruption/permeabilization composition.

31. The apparatus of claim 30, wherein said cell lysis/disruption/permeabilization composition is selected from the group consisting of a detergent, an enzyme, an inorganic salt, an acid, a base, and a buffering agent.

32. The apparatus of claim 21, wherein said housing is a tube, a bottle, a vial, an ampule, a microspin tube, a well, a column, a mini-column, a multi-well plate, a bag, a box, or a carton.

33. A kit for use in isolating a protein or peptide molecule or a population of protein or peptide molecules, said kit comprising the apparatus of claim 21.

34. The kit of claim 33, further comprising at least one composition selected from the group consisting of chromatographic resins that bind proteins or peptides, chromatographic resins that bind impurities, chromatographic resins having bound thereto protein modifying reagents, chromatographic resins having bound thereto enzymes, chromatographic resins having bound thereto nucleic acids, chromatographic resins having bound thereto an enzyme substrate, filters, and compositions capable of being used for detecting or quantifying the amount of protein or nucleic acid present in the sample.

35. The kit of claim 33, further comprising at least one composition selected from the group consisting of antibodies which bind to the protein or peptides of the invention, substrates for said protein or peptides, ligands for said proteins or peptides, cofactors for said protein or peptides, nucleic acid molecules which bind to said proteins or peptides, inhibitors of said proteins or peptides, enzymes which modify said proteins or peptides, compositions which modify said proteins or peptides, compositions which bind said proteins or peptides, compositions which are bound by said proteins or peptides, and compositions capable of being used for detecting or quantifying the amount of protein or nucleic acid present in the sample.

36. The kit of claim 33, wherein all compositions are contained in one or more fluid channels so that the sample may pass through the at least one pore-containing matrix and directly contact the at least one composition of claim 34 or 35 without the need for removal and re-application of the sample.

37. The kit of claim 33, wherein all compositions are contained in two or more fluid channels or containers such that the sample may be directly applied to the at least one composition of claim 34 or 35, after passing through the at least one pore-containing matrix.